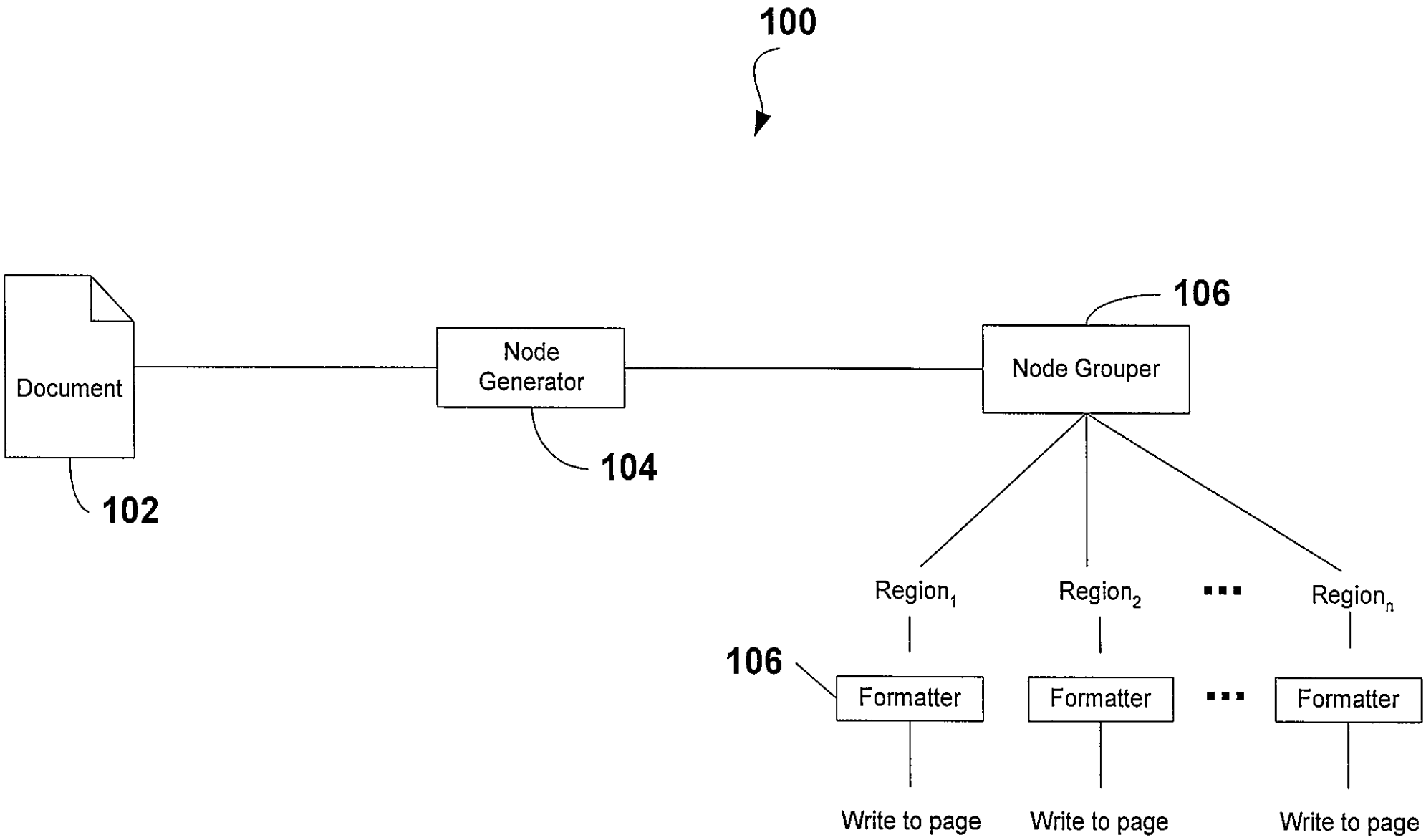
100
Document
102
Node Generator
104
Node Grouper
106
Region1
Region2
Regionn
106
Formatter
Formatter
Formatter
Write to page
Write to page
Write to page

FIGURE 1

200

```
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  <title>DBMS Internals</title>
  <author>
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  </author>
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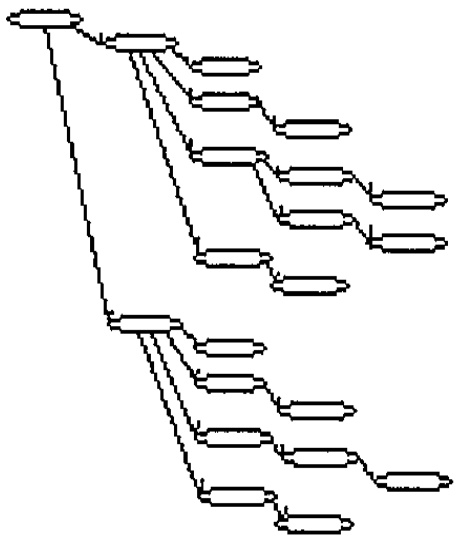


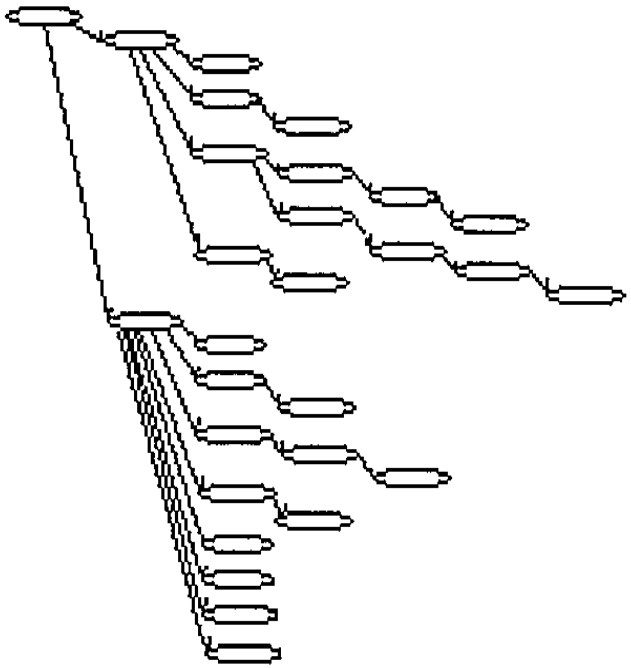


FIGURE 2

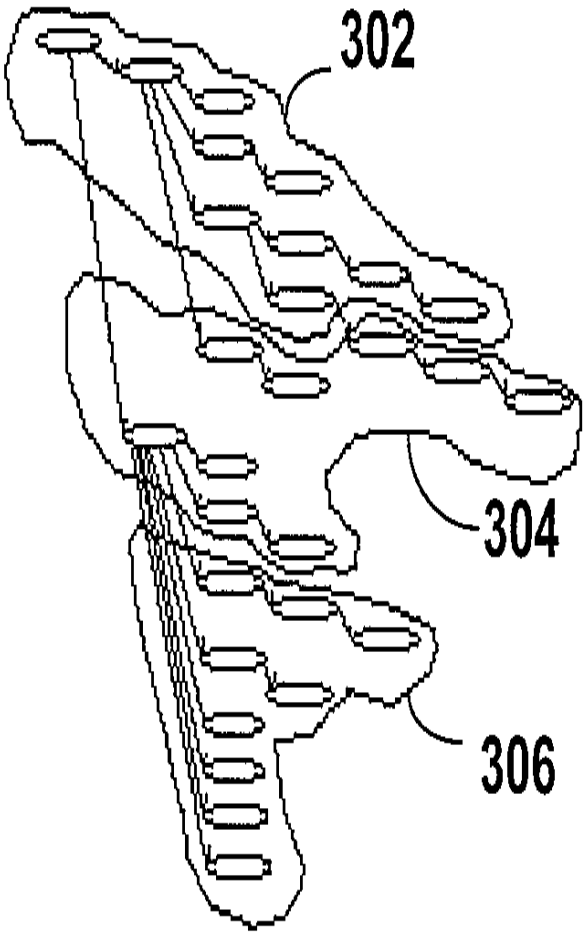


FIGURE 3a

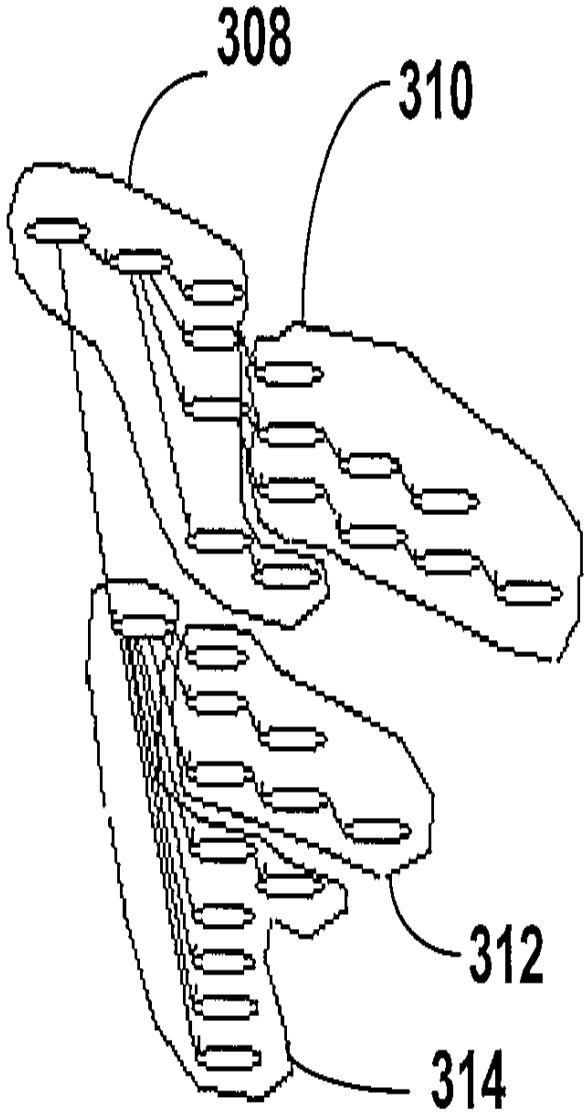


FIGURE 3b

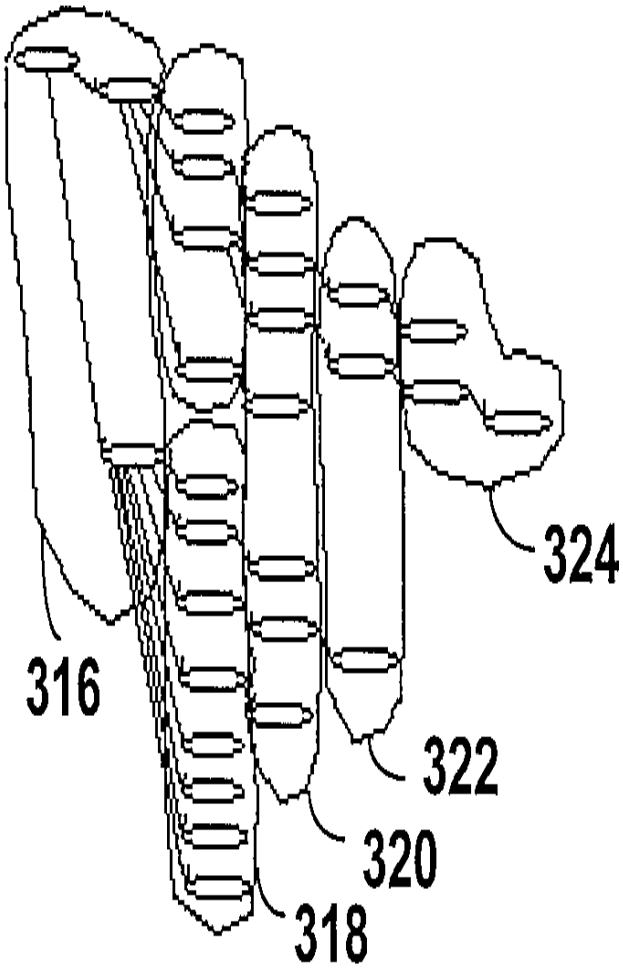


FIGURE 3c

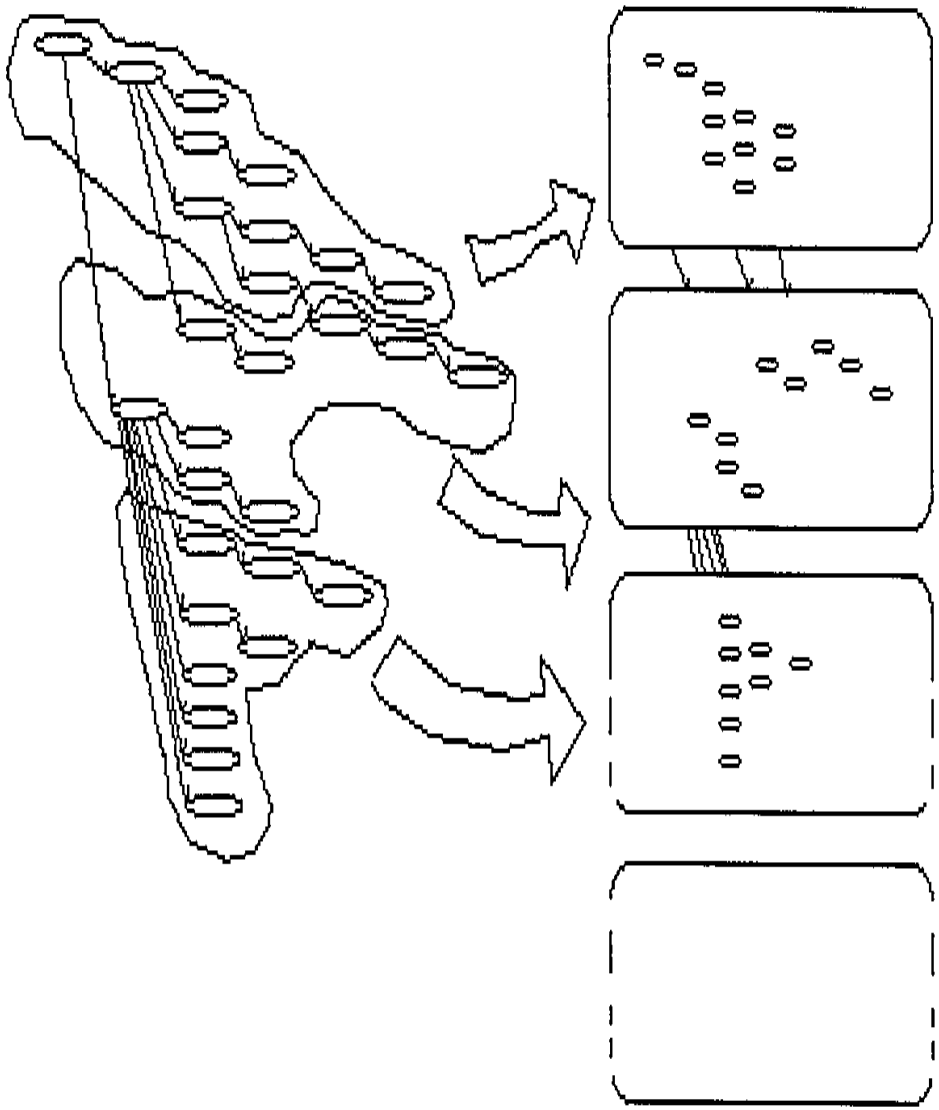


FIGURE 4a

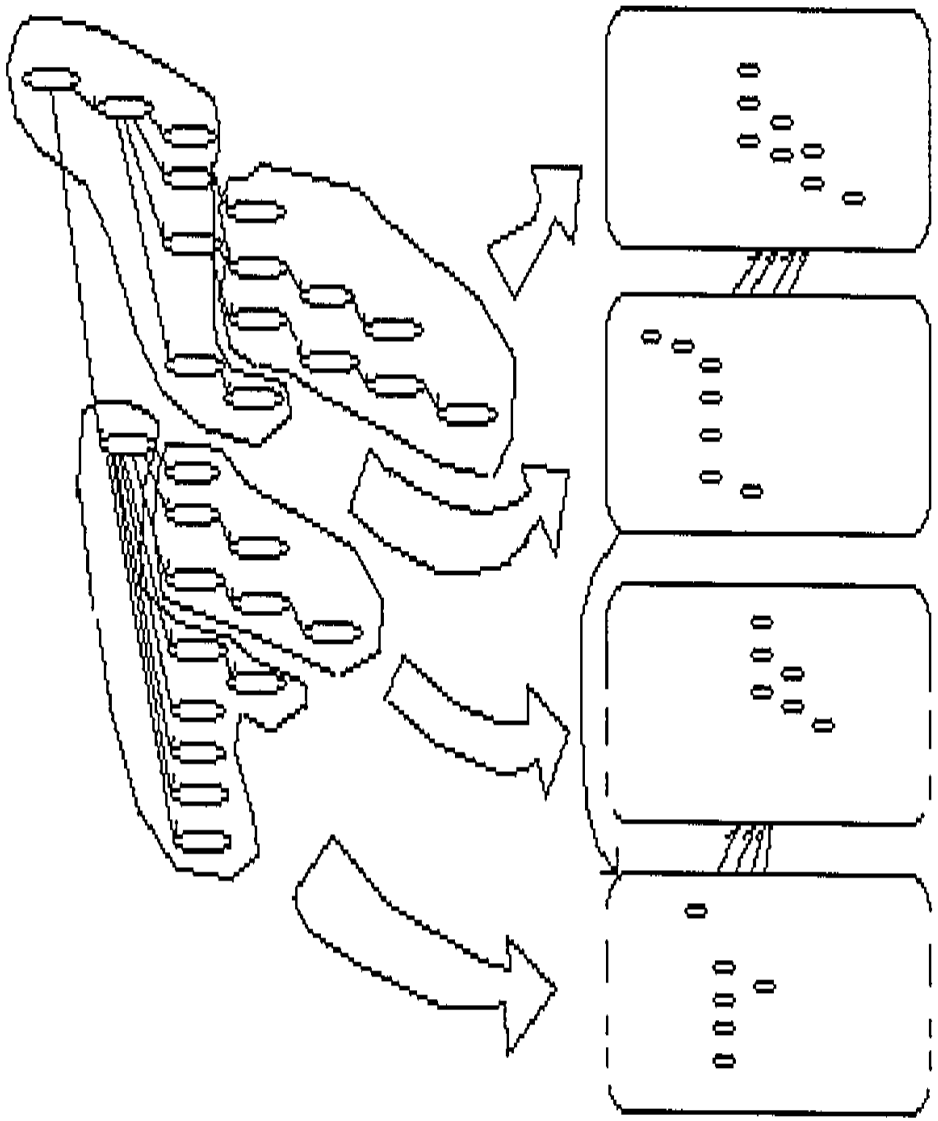


FIGURE 4b

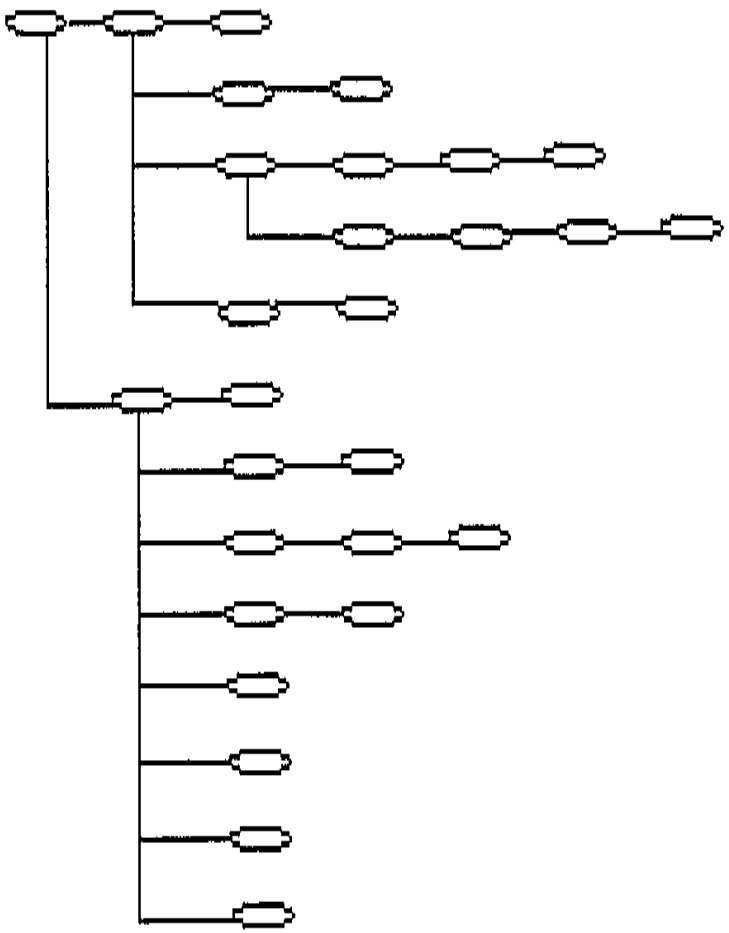


FIGURE 5a

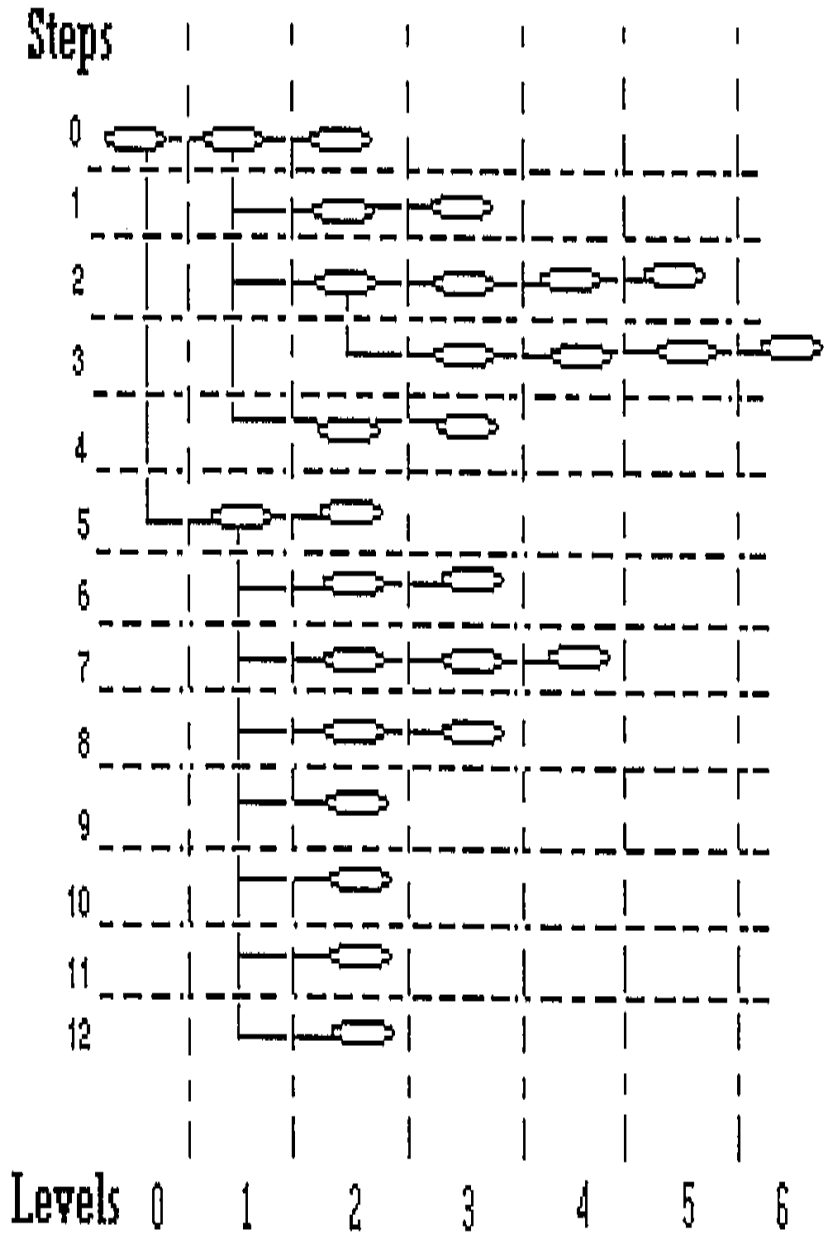


FIGURE 5b

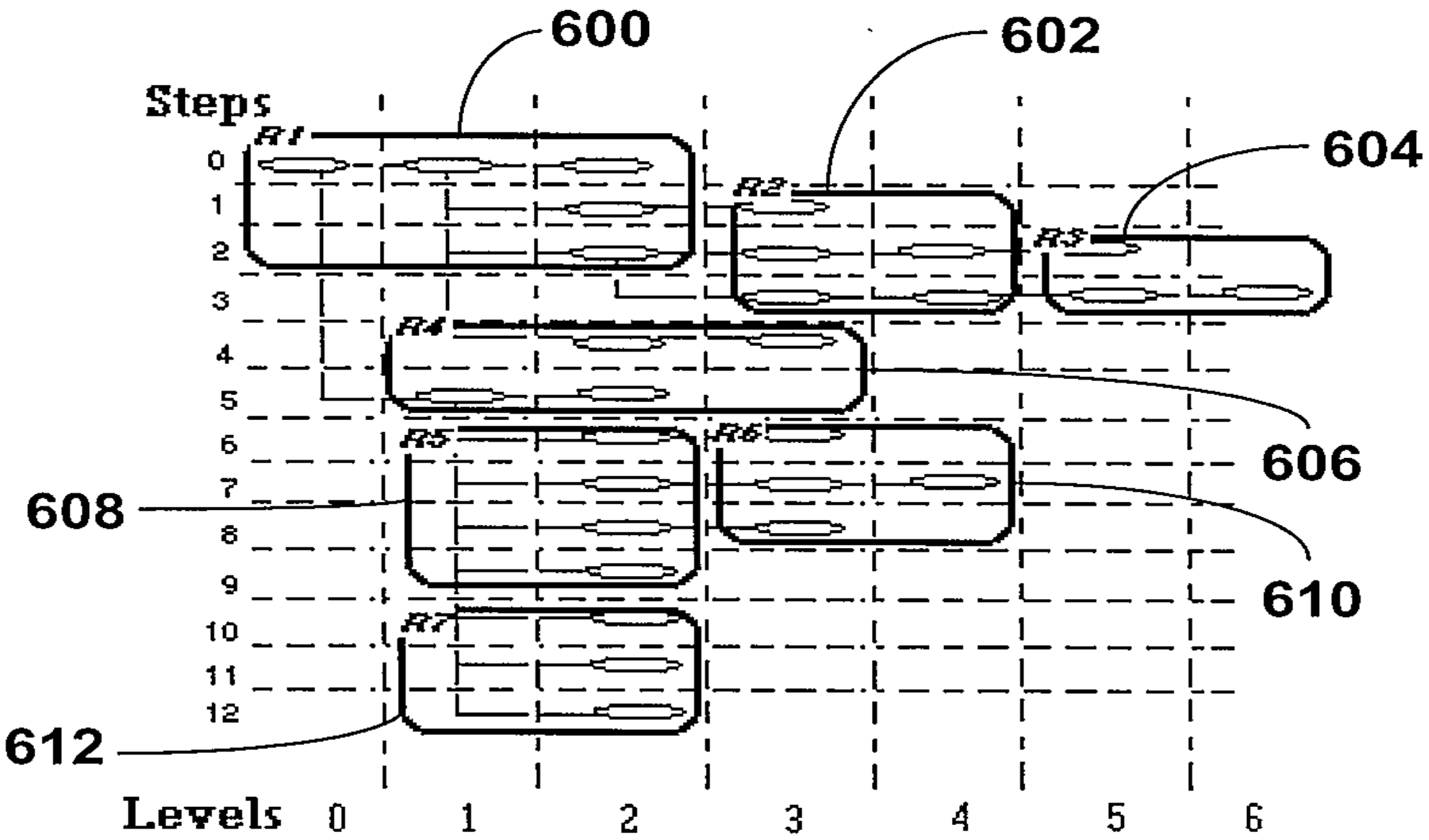

600
602
604
606
608
610
612
Steps
0
1
2
3
4
5
6
7
8
9
10
11
12
R1
R2
R3
R4
R5
R6
R7
Levels
0
1
2
3
4
5
6

FIGURE 6

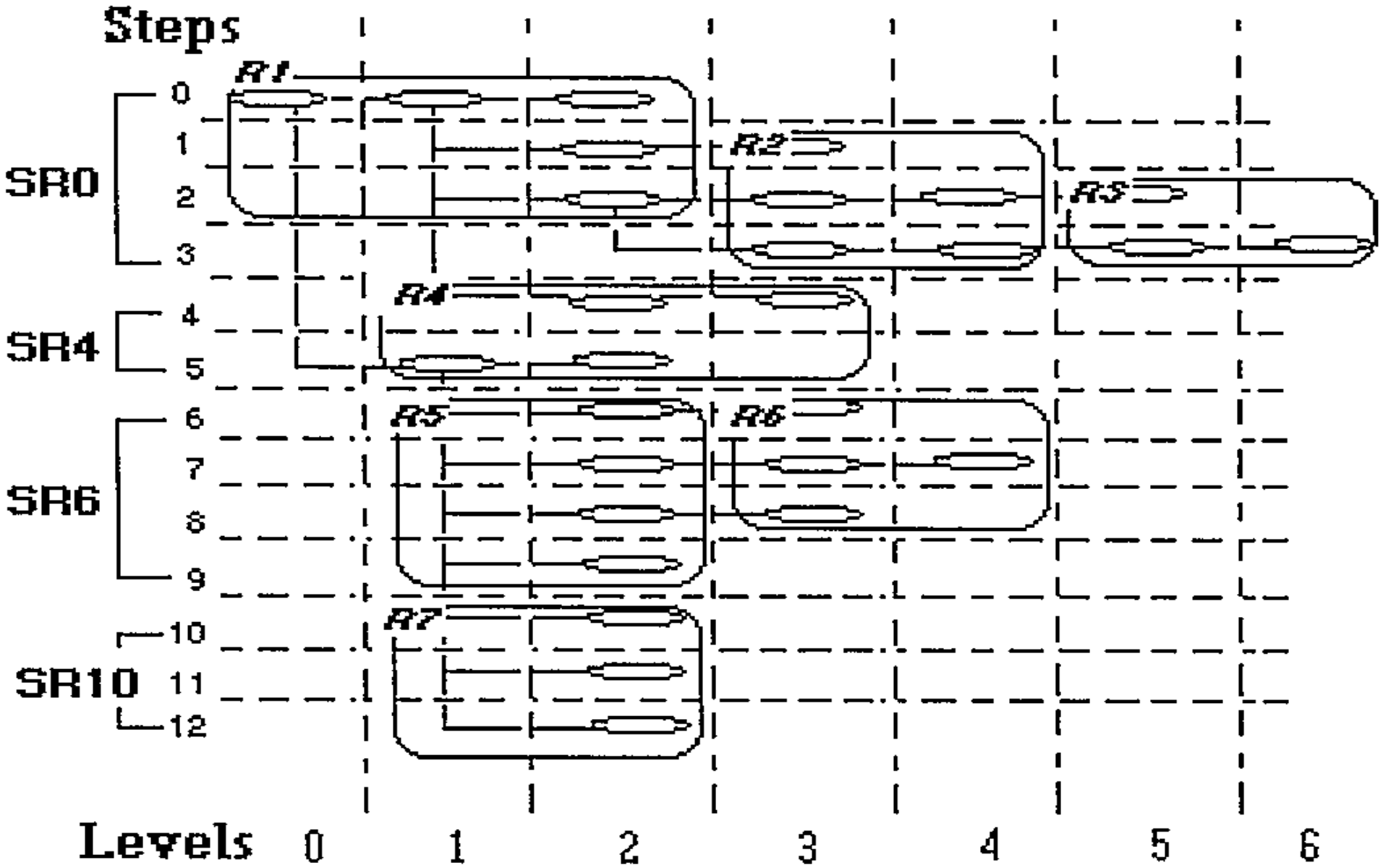

Steps
R1
R2
R3
R4
R5
R6
R7
SR0
SR4
SR6
SR10
0
1
2
3
4
5
6
7
8
9
10
11
12
Levels
0
1
2
3
4
5
6

FIGURE 7

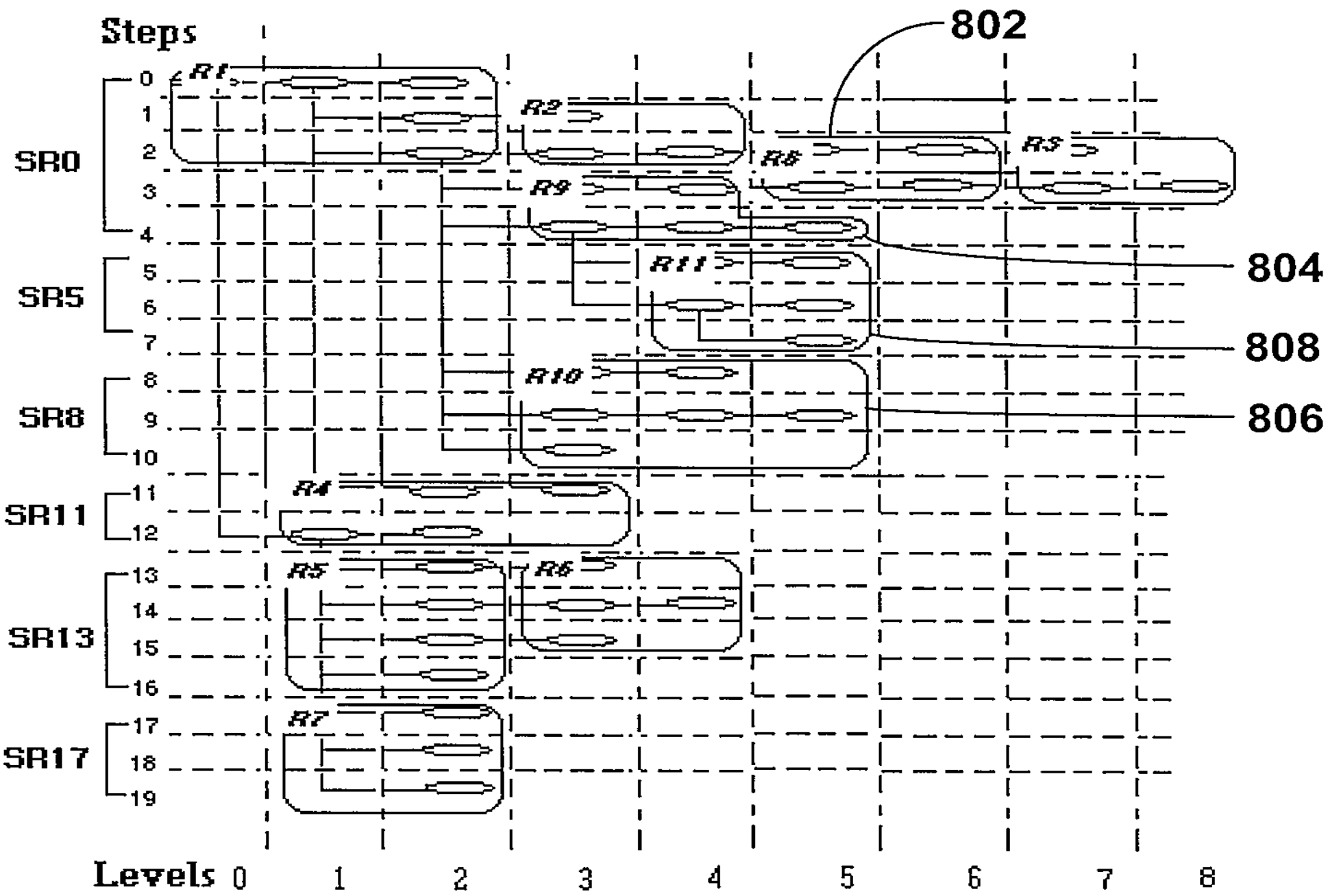

Steps
802
R1
R2
R3
R8
R9
SR0
0
1
2
3
4
SR5
5
6
7
R11
804
808
SR8
8
9
10
R10
806
SR11
11
12
R4
SR13
13
14
15
16
R5
R6
SR17
17
18
19
R7
Levels
0
1
2
3
4
5
6
7
8

FIGURE 8

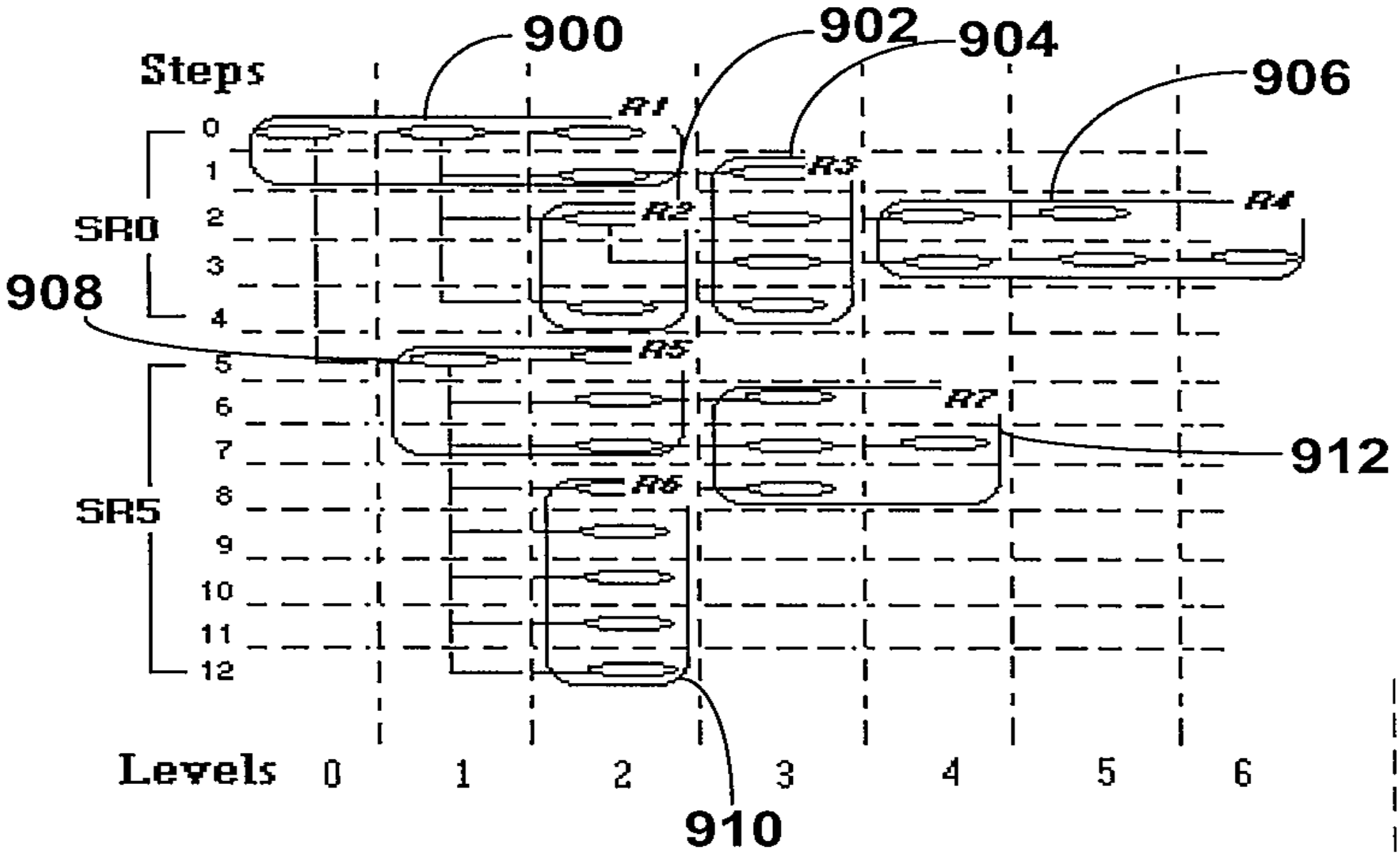

900
902
904
906
Steps
R1
R2
R3
R4
R5
R6
R7
SR0
SR5
908
912
910
0
1
2
3
4
5
6
7
8
9
10
11
12
Levels
0
1
2
3
4
5
6

FIGURE 9

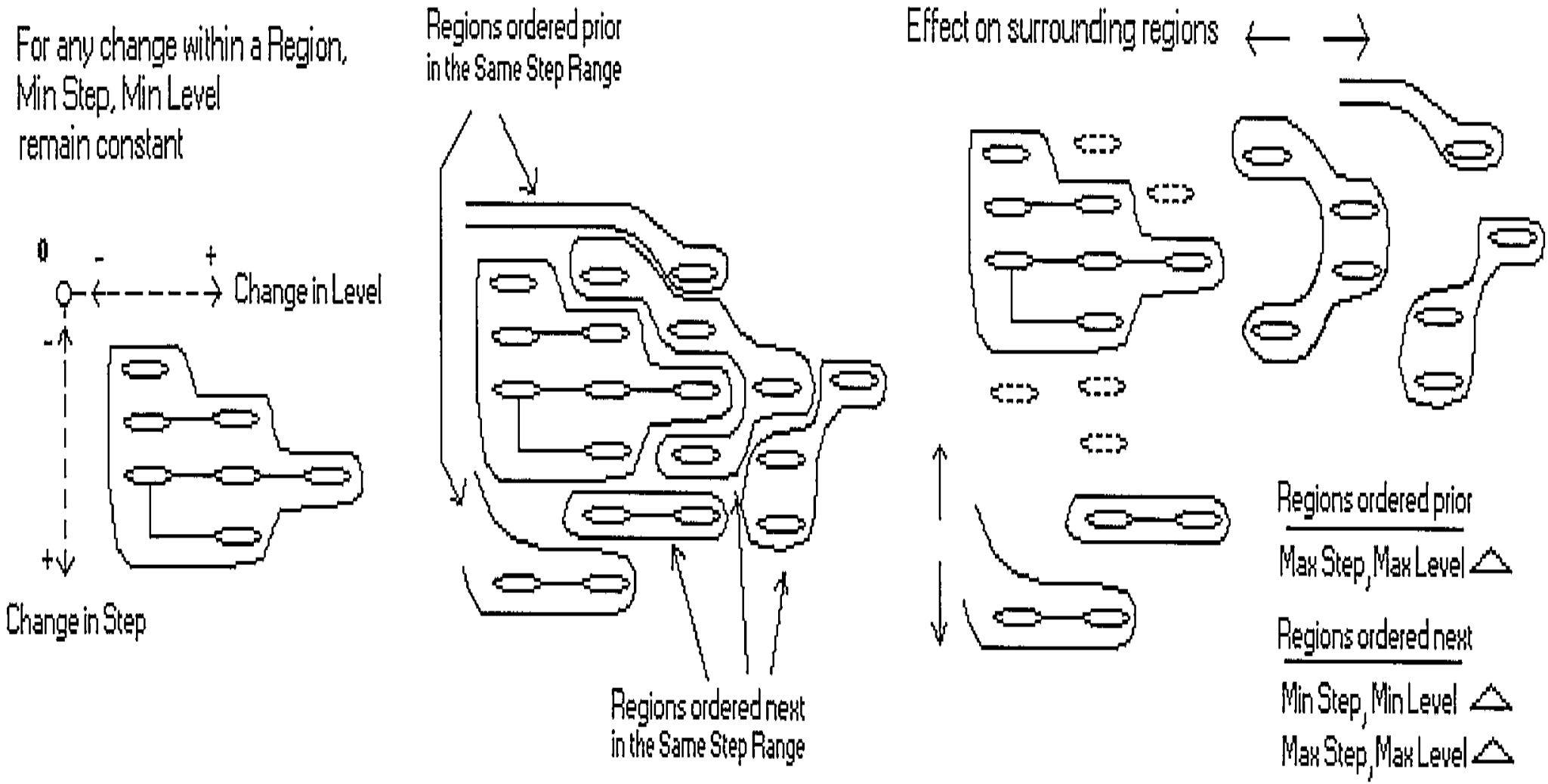

For any change within a Region,
Min Step, Min Level
remain constant
0
-
+
Change in Level
-
+
Change in Step
Regions ordered prior
in the Same Step Range
Regions ordered next
in the Same Step Range
Effect on surrounding regions
Regions ordered prior
Max Step, Max Level
Regions ordered next
Min Step, Min Level
Max Step, Max Level

FIGURE 10

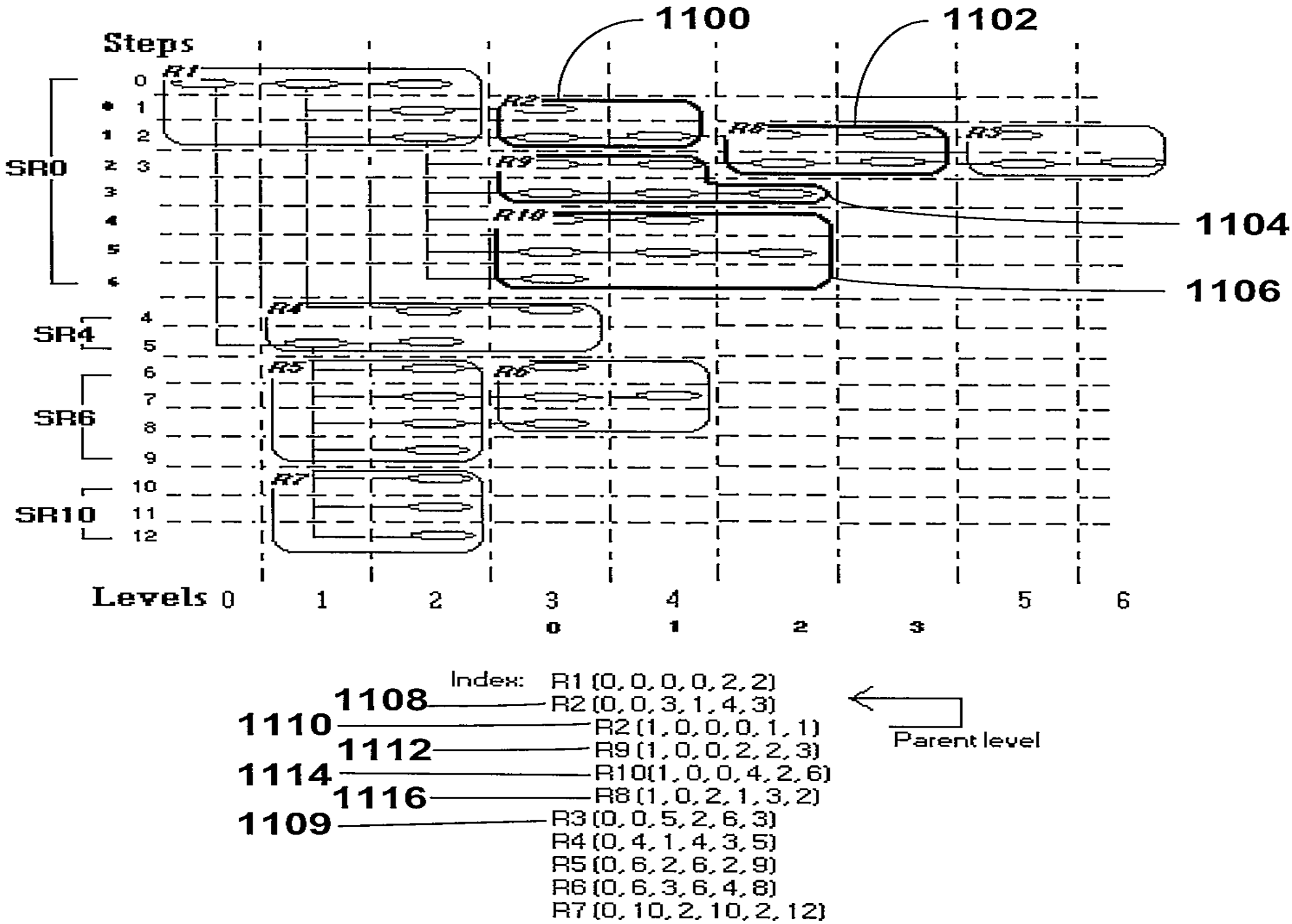
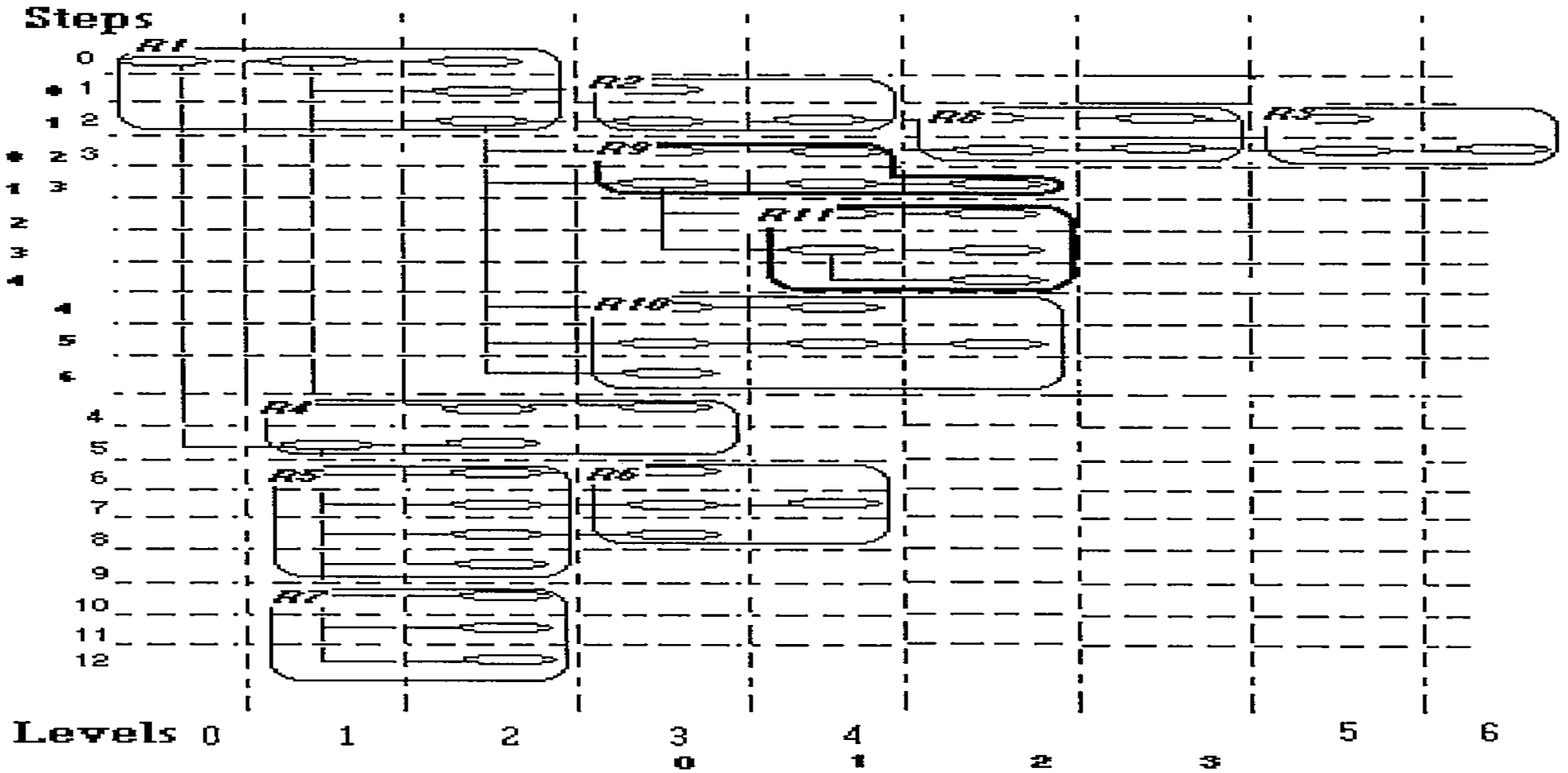

1100
1102
Steps
R1
R2
R8
R3
R9
R10
1104
1106
SR0
SR4
SR6
SR10
R4
R5
R6
R7
Levels 0 1 2 3 4 5 6
0 1 2 3
Index: R1 (0, 0, 0, 0, 2, 2)
1108 R2 (0, 0, 3, 1, 4, 3)
1110 R2 (1, 0, 0, 0, 1, 1)
1112 R9 (1, 0, 0, 2, 2, 3)
1114 R10(1, 0, 0, 4, 2, 6)
1116 R8 (1, 0, 2, 1, 3, 2)
1109 R3 (0, 0, 5, 2, 6, 3)
R4 (0, 4, 1, 4, 3, 5)
R5 (0, 6, 2, 6, 2, 9)
R6 (0, 6, 3, 6, 4, 8)
R7 (0, 10, 2, 10, 2, 12)
Parent level

FIGURE 11

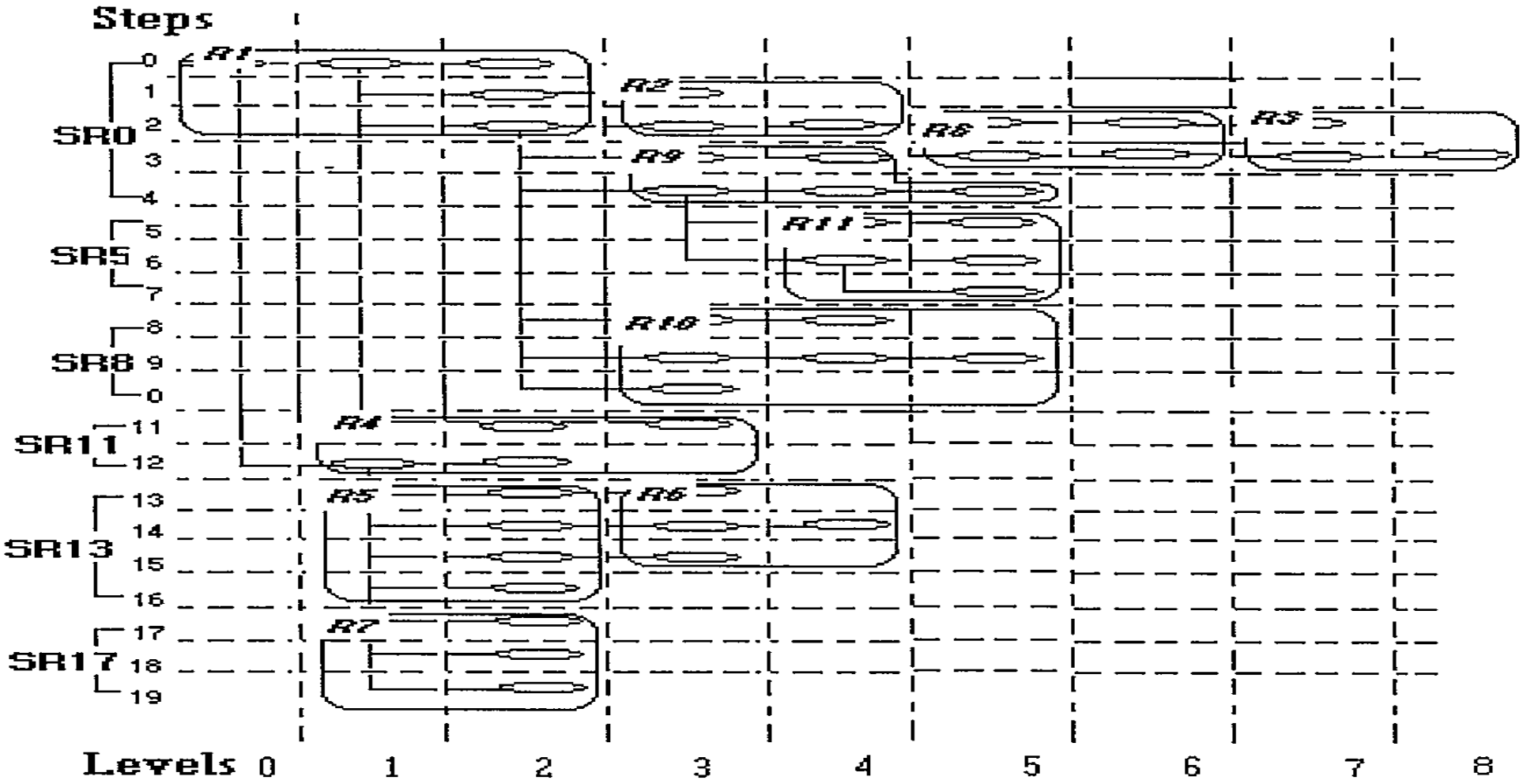


Index:
R1 (0, 0, 0, 0, 2, 2)
R2 (0, 0, 3, 1, 4, 3)
R2 (1, 0, 0, 0, 1, 1)
R9 (1, 0, 0, 2, 2, 3)
R9 (2, 0, 0, 0, 2, 1)
R11 (2, 0, 1, 2, 2, 4)
R10 (1, 0, 0, 4, 2, 6)
R8 (1, 0, 2, 1, 3, 2)
R3 (0, 0, 5, 2, 6, 3)
R4 (0, 4, 1, 4, 3, 5)
R5 (0, 6, 2, 6, 2, 9)
R6 (0, 6, 3, 6, 4, 8)
R7 (0, 10, 2, 10, 2, 12)

1200
1202
1204

Parent level
Parent level

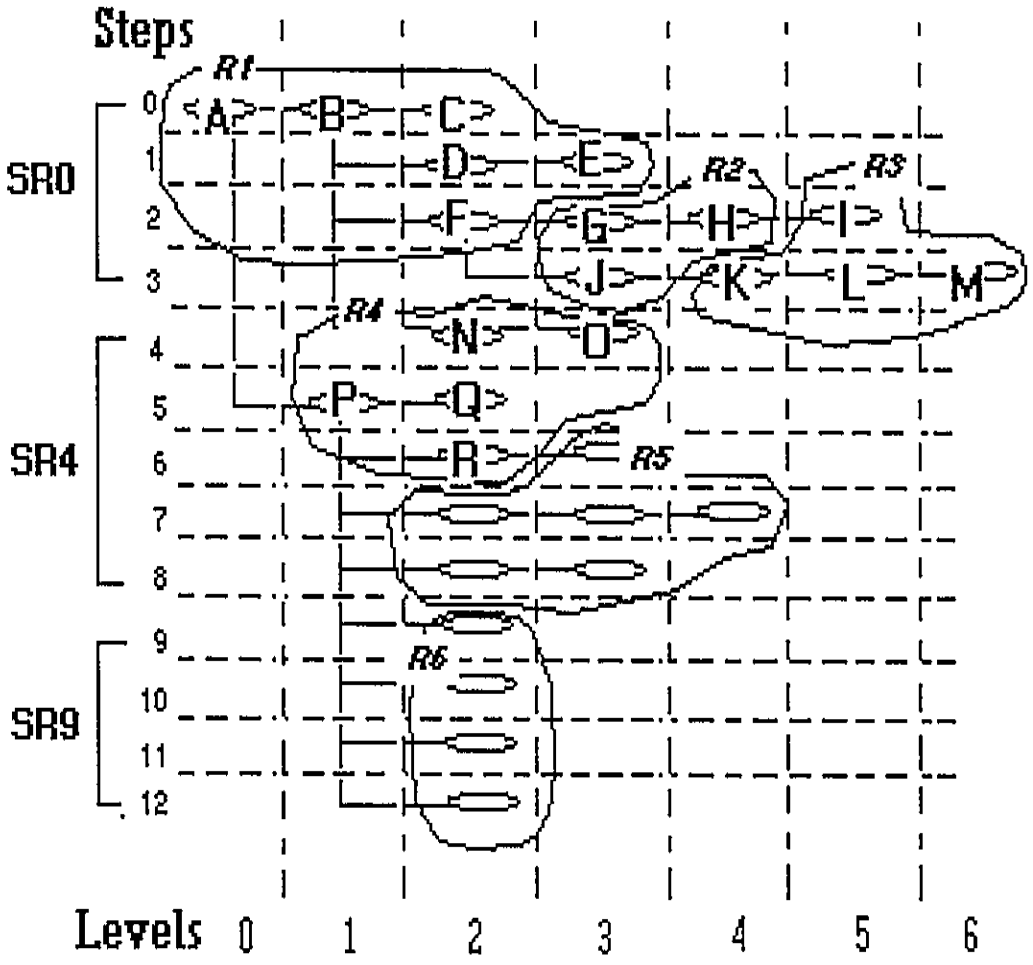
FIGURE 12



Index:

R1 (0, 0, 0, 0, 2, 2)
R2 (0, 0, 3, 1, 4, 2)
R9 (0, 0, 3, 3, 5, 4)
R8 (0, 0, 5, 2, 6, 3)
R3 (0, 0, 7, 2, 8, 3)
R11 (0, 5, 4, 5, 5, 7)
R10 (0, 8, 3, 8, 5, 10)
R4 (0, 11, 1, 11, 3, 12)
R5 (0, 13, 2, 13, 2, 16)
R6 (0, 13, 3, 13, 4, 15)
R7 (0, 17, 2, 17, 2, 19)

FIGURE 13



Index:
R1 (0, 0, 0, 0, 3, 2)
R2 (0, 0, 3, 2, 4, 3)
R3 (0, 0, 4, 2, 3, 6)
R4 (0, 4, 1, 4, 3, 5)
R5 (0, 4, 2, 6, 4, 8)
R6 (0, 9, 2, 9, 2, 12)

FIGURE 14a

(Step, Level)

R1 (0,0)

	original	region relative
A	(0,0)	(0,0)
B	(0,1)	(0,1)
C	(0,2)	(0,2)
D	(1,2)	(1,2)
E	(1,3)	(1,3)
F	(2,2)	(2,2)

R2 (2,3)

	original	region relative
G	(2,3)	(0,0)
H	(2,4)	(0,1)
J	(3,3)	(1,0)

R3 (2,4)

	original	region relative
I	(2,5)	(0,1)
K	(3,4)	(1,0)
L	(3,5)	(1,1)
M	(3,6)	(1,2)

R4 (4,1)

	original	region relative
N	(4,2)	(0,1)
O	(4,3)	(0,2)
P	(5,1)	(1,0)
Q	(5,2)	(1,1)
R	(6,2)	(2,1)

FIGURE 14b

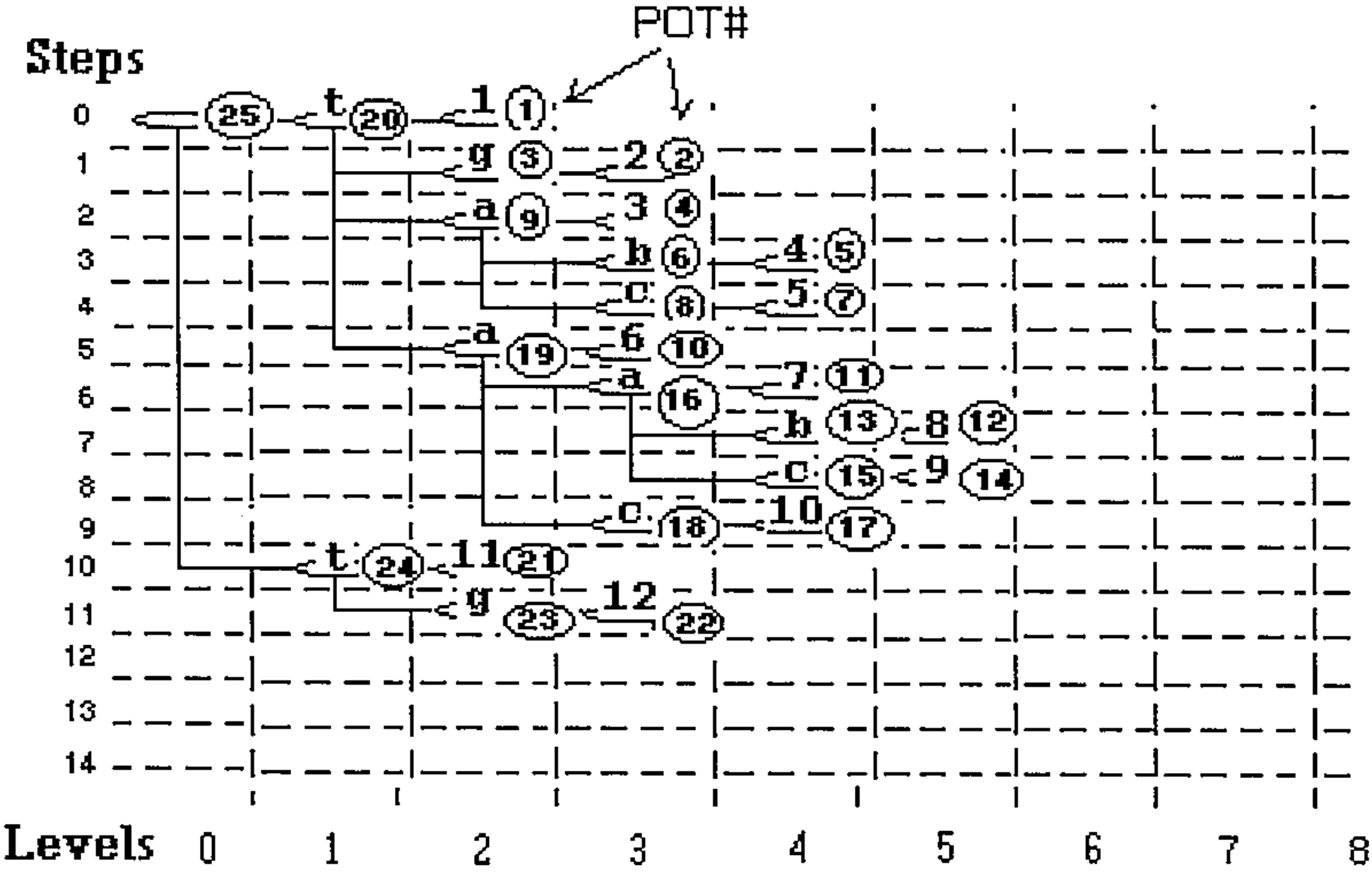


FIGURE 15

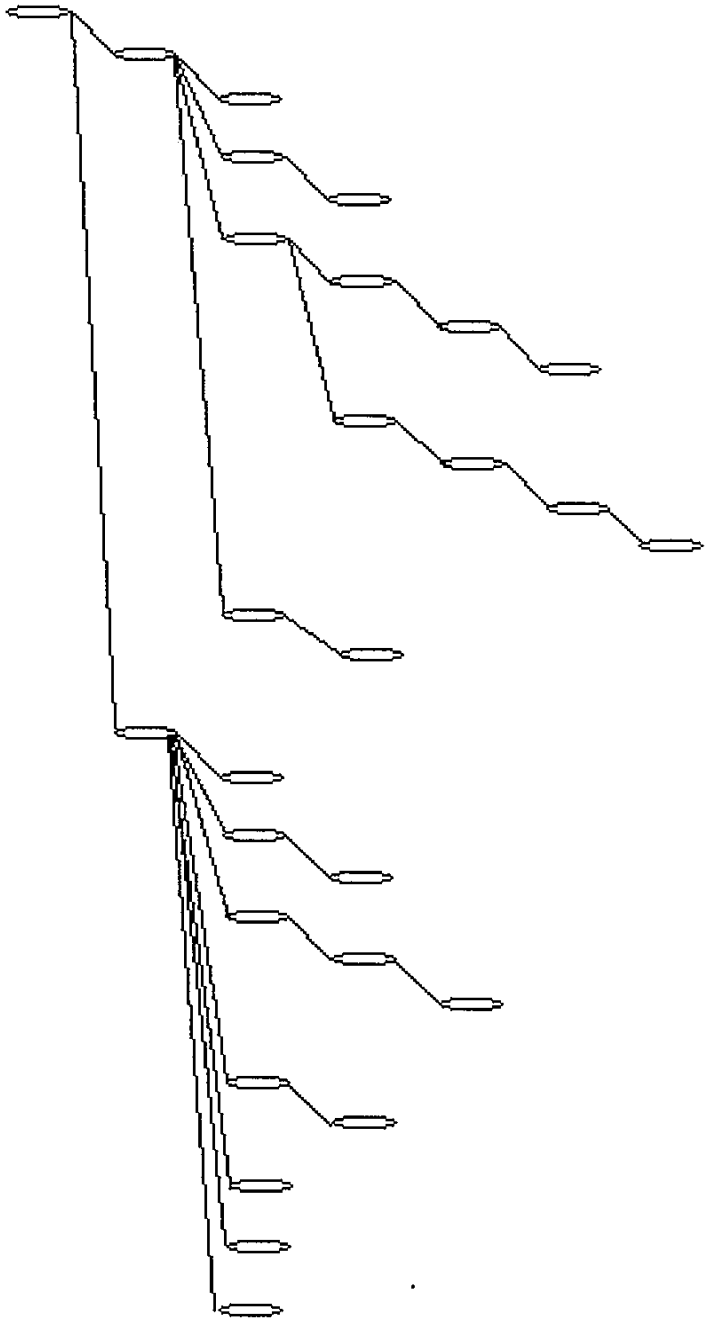


FIGURE 16a

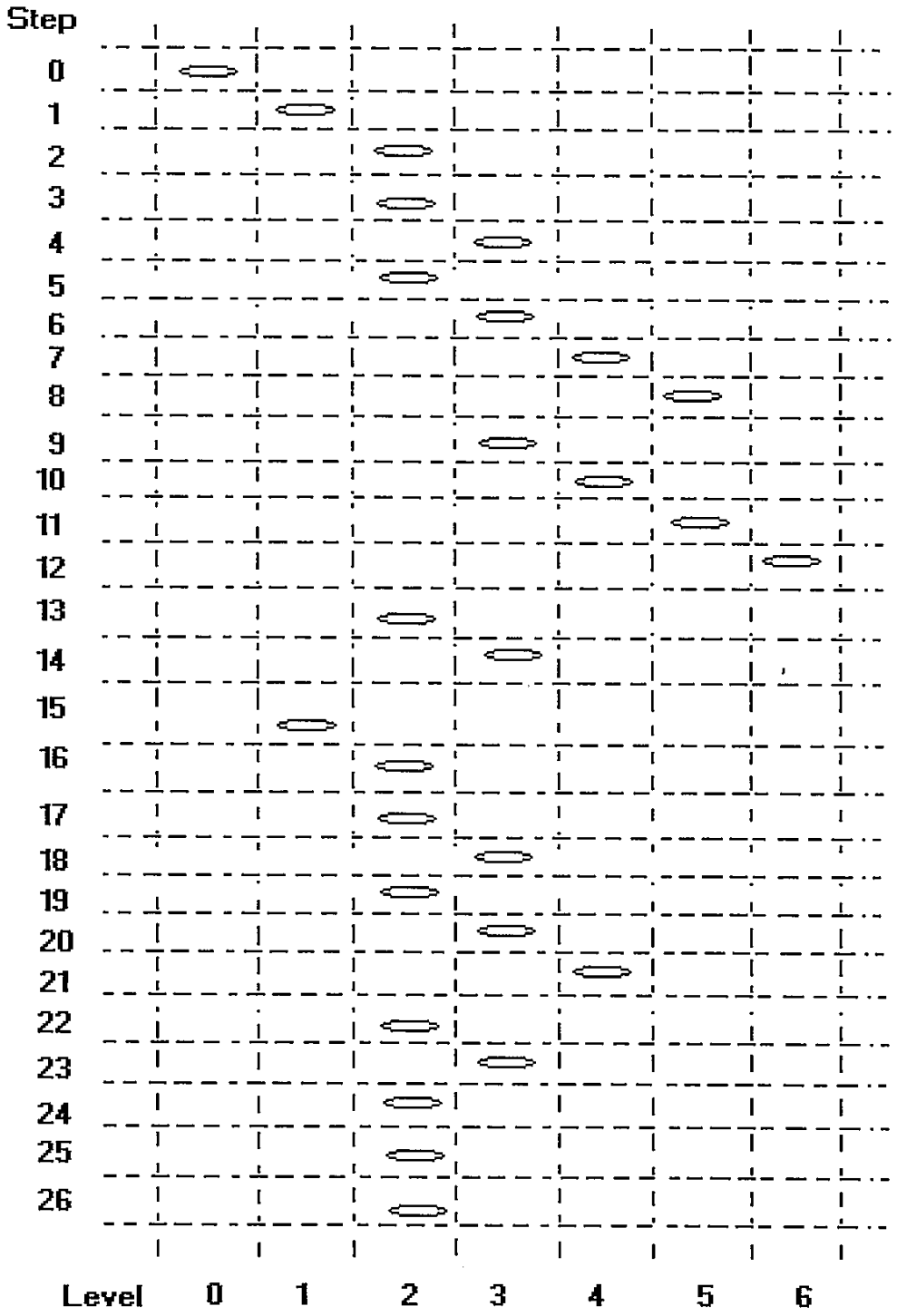


FIGURE 16b

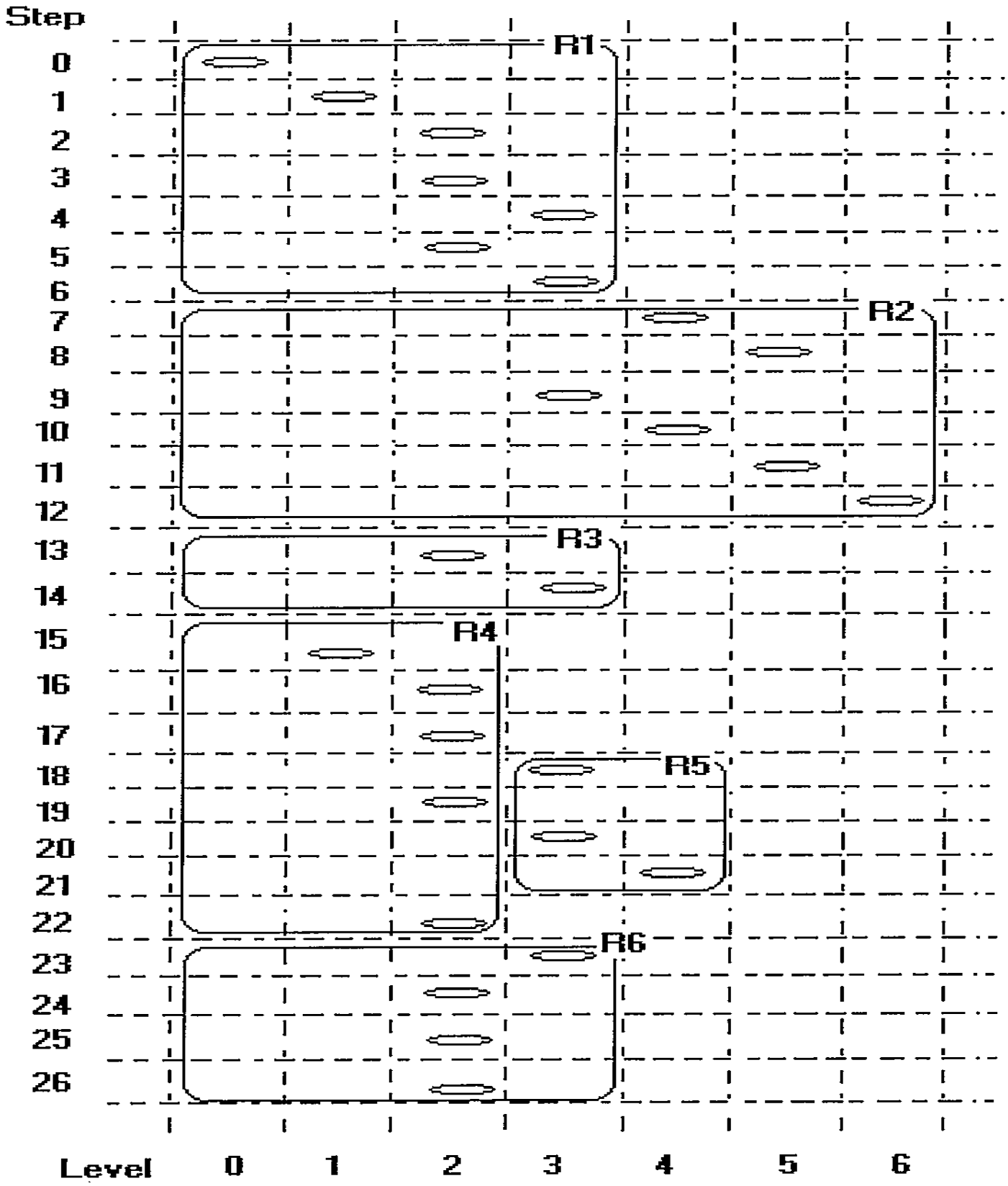

Step
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
R1
R2
R3
R4
R5
R6
Level
0
1
2
3
4
5
6

FIGURE 16c

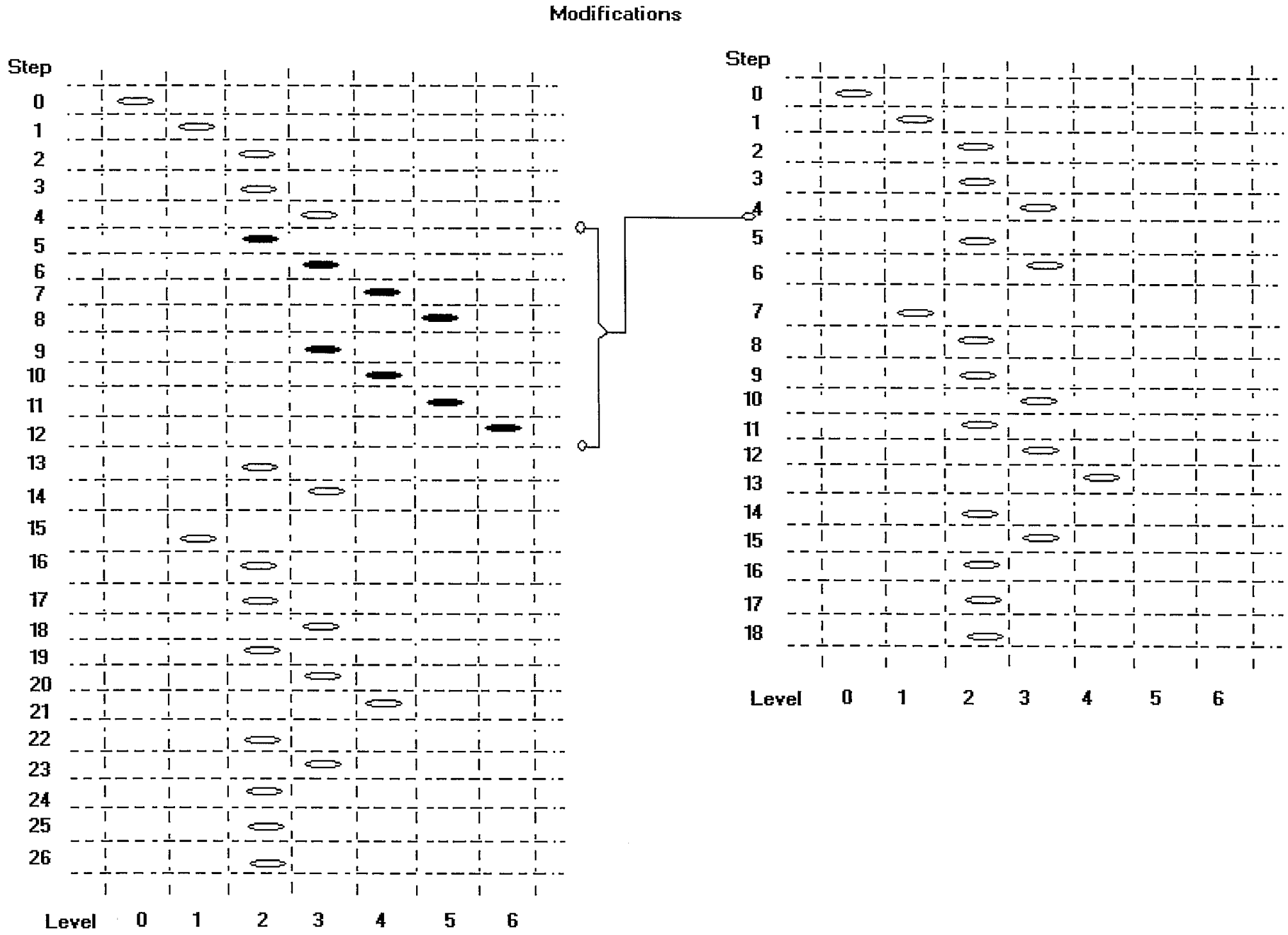

Modifications
Step
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
Level 0 1 2 3 4 5 6
Step
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
Level 0 1 2 3 4 5 6

FIGURE 16d

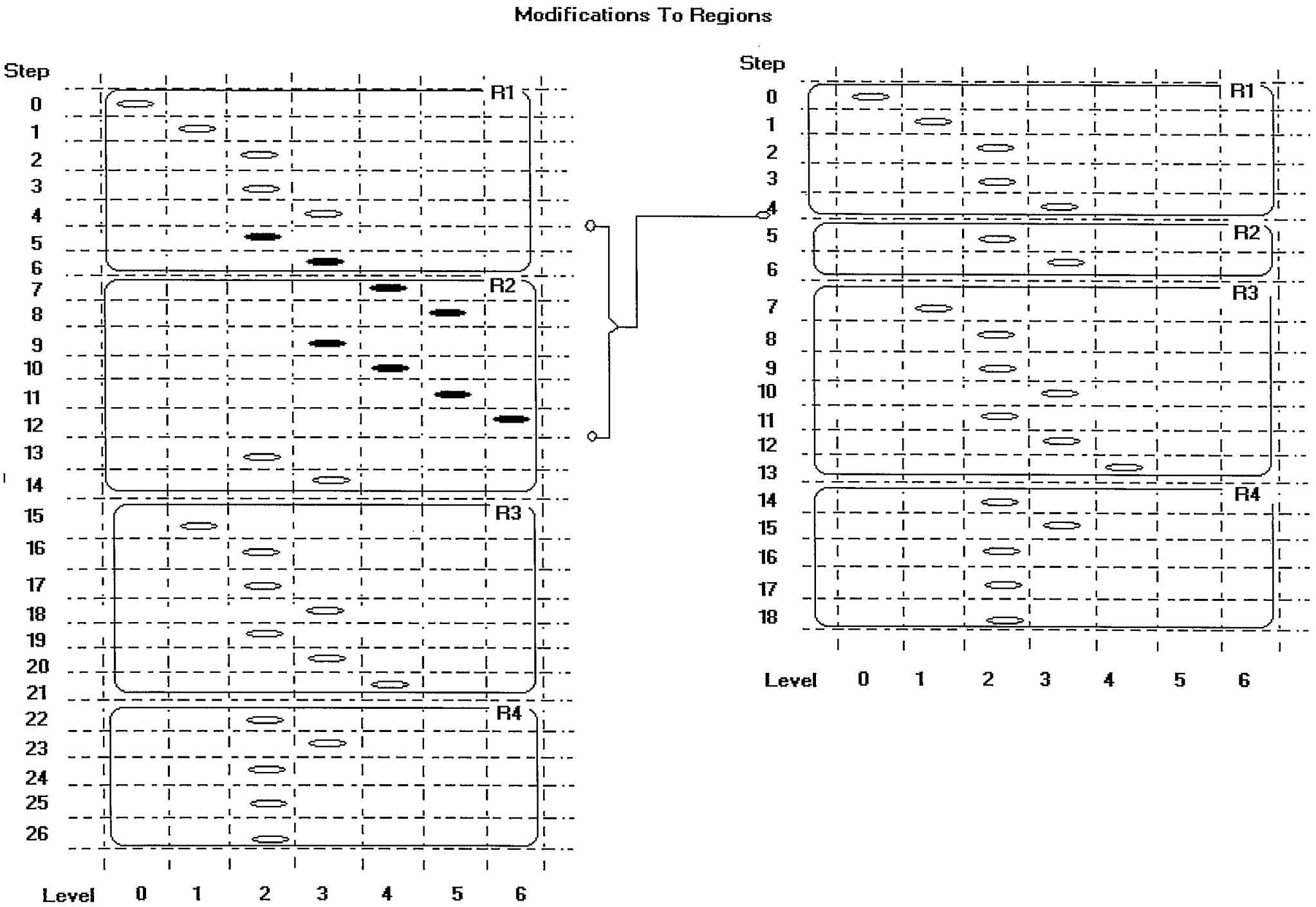

Modifications To Regions
Step
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
R1
R2
R3
R4
Level 0 1 2 3 4 5 6
Step
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
R1
R2
R3
R4
Level 0 1 2 3 4 5 6

FIGURE 16e

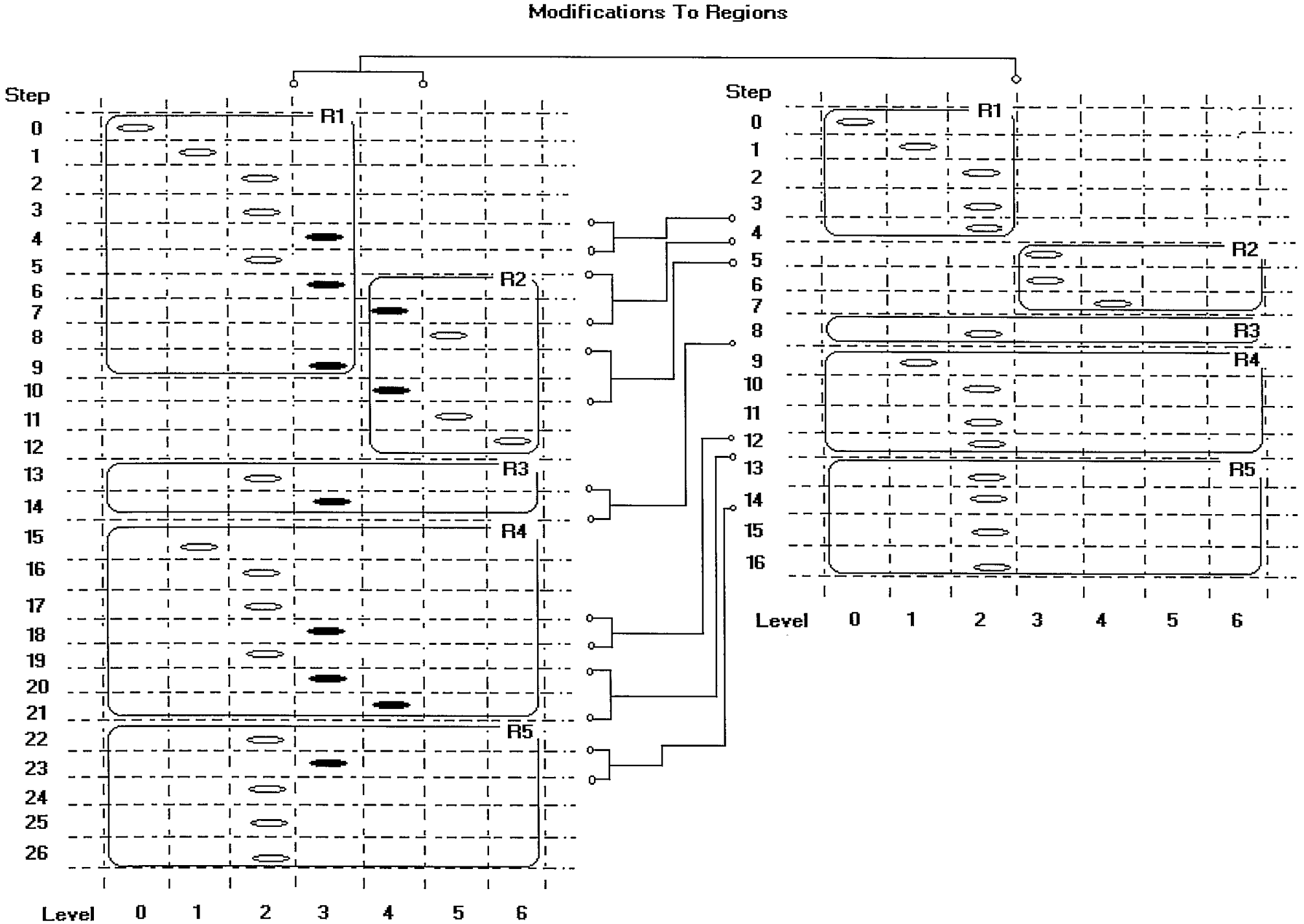

Modifications To Regions
Step
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
R1
R2
R3
R4
R5
Level
0
1
2
3
4
5
6
Step
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
R1
R2
R3
R4
R5
Level
0
1
2
3
4
5
6

FIGURE 16f

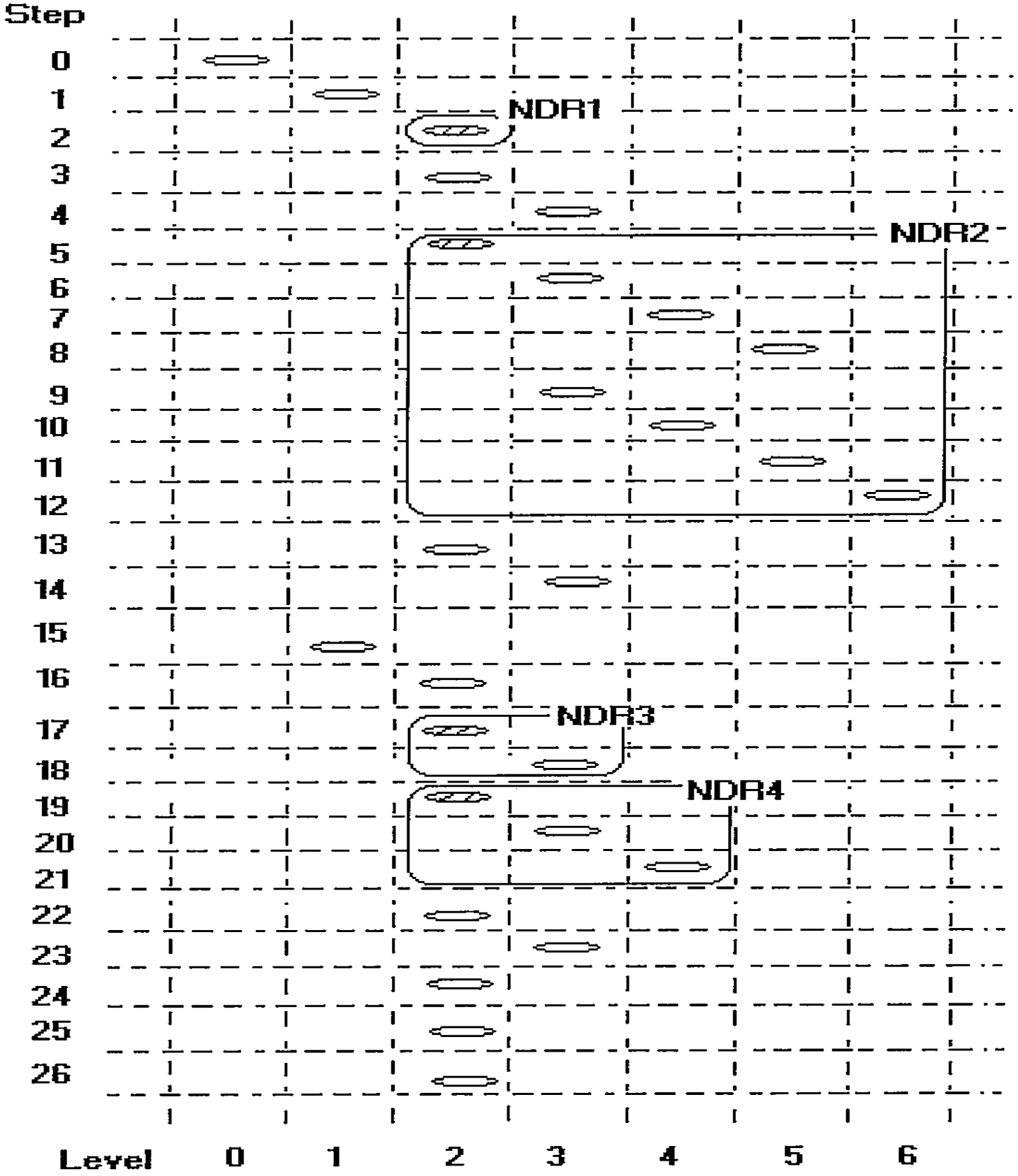

Step
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
NDR1
NDR2
NDR3
NDR4
Level
0
1
2
3
4
5
6

FIGURE 17